Published in final edited form as:

J Abnorm Child Psychol. 2016 November ; 44(8): 1587–1597. doi:10.1007/s10802-016-0137-9.

Parental Flooding During Conflict: A Psychometric Evaluation of a New Scale

Tamara Del Vecchio,
St. John's University

Michael F. Lorber,
New York University

Amy M. Smith Slep,
New York University

Jill Malik,
New York University

Richard E. Heyman, and
New York University

Heather M. Foran
University of Ulm, Germany

Abstract

Parents who are overwhelmed by the intensity and aversive nature of child negative affect — those who are experiencing flooding — may be less likely to react effectively and instead may focus on escaping the aversive situation, disciplining either overly permissively or punitively to escape quickly from child negative affect. However, there are no validated self-report measures of the degree to which parents experience flooding, impeding the exploration of these relations. Thus, we created and evaluated the Parent Flooding scale (PFS), assessing the extent to which parents believe their children's negative affect during parent-child conflicts is unexpected, overwhelming and distressing. We studied its factorial validity, reliability, and concurrent validity in a community sample of 453 couples with 3- to 7-year-old children (51.9% girls) recruited via random digit dialing. Confirmatory factor analyses indicated a one-factor solution with excellent internal consistency. Test-retest stability over an average of 5.6 months was high. Concurrent validity was suggested by the associations of flooding with parents' aggression toward their children, overreactive and lax discipline, parenting satisfaction, and parents' anger, as well as with child externalizing behavior and negative affect. Incrementally concurrent validity analyses indicated that flooding was a unique predictor of mothers' and fathers' overreactive discipline and fathers' parent-child aggression and lax discipline, over and above the contributions of parents' anger and children's negative affect. The present results support the psychometric validity of the PFS.

Correspondence concerning this article should be addressed to Tamara Del Vecchio, Department of Psychology, St. John's University, Queens, NY 11439. delvecct@stjohns.edu. Phone: 718-990-8327.

Conflict of Interest

The authors declare that they have no conflict of interest.

Keywords

Flooding; parenting; discipline; affect regulation

Flooding is a term first introduced by early behavior therapists in relation to the treatment of anxiety by immediate and prolonged exposure to feared stimuli (e.g., Rachman, 1966). Flooding in interpersonal relationships was later introduced by Gottman and colleagues (e.g., Gottman, 1993; Gottman & Katz, 1989) who described it as a feeling that a family members' "negative emotions are unexpected, unprovoked, intense, overwhelming, and disorganizing" (Gottman, 1993, p. 62). In this interpersonal context, flooding is not a particular emotional experience (e.g., sadness or anger), but instead is the extent to which another's emotion is experienced as overpowering and interfering. Moreover, flooding may exist at the juncture of emotion and cognition in that the experience of another person's negative emotion as overwhelming is an affect-laden appraisal.

When flooded, sympathetic nervous system reactivity (e.g., increased heart rate, blood pressure and respiration; Kunzmann, Kupperbusche, & Levenson, 2005; Palomba, Sarlo, Angrilli, Mini, & Stegagno, 2000) is thought to overwhelm rational deliberation, making it difficult to attend to the situation and engage in calm, organized behaviors. Gottman (1993) theorized that flooding may become an overlearned response to conflict, creating a powerful motivation to select behavioral responses that terminate the aversive state of being flooded. This might be rewarded immediately but negatively impact interpersonal relationships in the long run, as individuals who experience more flooding are more likely to report highly aversive interactions with their partners (Gottman, 1996), weaker bonds with their partners (Doohan, Carrère, & Riggs, 2010), and are less likely to perceive their partners positively (Boesch, Cerqueira, Safer, & Wright, 2007). Gottman (1993) further suggested that flooding can contribute to a distance and isolation cascade, in which individuals increasingly perceive the dyadic negative interactions as global and stable leading increasing emotional disengagement.

Flooding may also occur in parents during conflicts with their children, particularly when their children express negative affect. Negative emotional responses to child negative affect can be useful in increasing parental responsiveness to children's needs (Leerkes, 2010). However, parents for whom child negative affect is particularly unexpected, overwhelming, and distressing may be less likely to attend to their children's needs, or respond with effective parenting, and may instead focus on their own needs to reduce the aversive stimulation (Dix, 1991; Fabes, Eisenberg, & Miller, 1990; Martin, Clements, & Crnic, 2002).

Consistent with an escape-conditioning model (e.g., Gottman, 1993; Patterson, 2002), flooding may lead to hypervigilance to aversive conditioned cues (i.e., increased attention to early indicators of child negative affect) and the selection of overlearned negatively reinforced behavior (i.e., parent responses that terminate the emotional flooding). To the extent that some parents are overwhelmed by the intensity and aversive nature of these emotional experiences, they may consequently employ a discipline response, often either overly permissive or punitive, that offers the quickest escape from child negative affect

(Lorber, Mitnick, & Slep, 2015; Mammen, Kolko, & Pilkonis, 2002; Mence et al., 2014). Harsh and permissive discipline, although ineffective in the long-term, provides short-term relief from aversive child behavior (e.g., Patterson, 2002). Thus, flooding may result in habitual patterns of responding that serve to terminate the flooded experience and, inadvertently, amplify the child negative affect.

Despite the potential role of flooding in parenting, few studies have examined it in the parent-child context. This may be due in part to a lack of validated self-report measures of parental flooding. We found one measure that assesses the amount of distress parents experience in response to children's negative affect (Coping with Children's Negative Emotions Scale: Distress Tolerance subscale; Fabes, Poulin, Eisenberg, & Madden-Derdich, 2002). However, this measure does not address experiences of flooding specifically and instead focuses on parents' experiences of negative affect, including feeling upset, annoyed, angered, or embarrassed. Moreover, it does not assess parents' emotional experiences as related to parent-child conflict. Arguably, parents' flooded responses to their children's negative affect expressed during conflict, in contrast to child negative affect expressed across a variety of contexts, may be particularly important when predicting discipline patterns and parent-to-child aggression. To address this gap, Slep and Heyman (1998) developed a 15-item self-report measure of the degree to which parents experience flooding in the context of parent-child conflict based on a definition of flooding adapted from Gottman (1993) as the perception that the child's negative emotions are unexpected, unprovoked, intense, overwhelming, and disorganizing.

This is the first formal psychometric evaluation of this new measure, the Parent Flooding scale (PFS). Preliminary indicators of its validity are found in the results of three other investigations. Mence et al. (2014) found that flooding (assessed with the PFS) was associated with overreactive (but not lax) discipline and with child externalizing behavior; flooding and observed child anger were not significantly related. Slep and O'Leary (2007) found that flooding (assessed with the PFS and using the same sample as the present investigation) mediated parental anger's relations with both overreactive discipline and parenting satisfaction in a model predicting parental aggression toward their children. Lorber et al. (2015) measured flooding experienced during a laboratory discipline encounter with a modified version of the PFS. They found that flooding was associated with both overreactive and lax discipline, mothers' experienced negative emotion and heart rate reactivity, as well as observed child misbehavior and negative affect. The association of flooding and discipline did not reflect confounding by mothers' experience of negative emotion. The PFS's internal consistency was strong in all three studies. Taken together, the results of Mence et al. (2014), Slep and O'Leary (2007), and Lorber et al. (2015) suggest the fit of the PFS in the nomological network of related constructs, but do not provide formal psychometric evaluations of the measure.

The Present Investigation

The purpose of this study was to evaluate the reliability and validity (factorial and concurrent) of the PFS. We conceptualized flooding as a single construct and, thus, hypothesized a one-factor solution. Because men, compared with women, reported greater

levels of negative flooding in Doohan et al. (2010), we examined gender differences in scale structure and mean PFS scores. Reliability was assessed via analyses of internal consistency and test-retest stability.

Concurrent validity was assessed by establishing the position of PFS scores in the nomological network of flooding (Westen & Rosenthal, 2003). Flooding is conceptually related to the experience of negative emotion in that both involve a negative experiential state. Yet flooding (e.g., experiencing child's affect as unexpected, overwhelming, and disorganizing) is distinct from a specific negative emotion (e.g., feeling angry). Flooding, as a response to child negative affect in conflictual encounters, is also related to but distinct from the affective component of child externalizing behavior (e.g., tantruming and screaming), and may also be associated with child externalizing behavior more broadly. Flooding is also thought to present a strong motive for escape behaviors (e.g., harsh, aggressive discipline, lax discipline) during parent-child conflict. Finally, the aversive nature of flooding may contribute to poor satisfaction with the parenting role, as flooding may signal that the child has become an aversive stimulus. In light of the above rationale, we hypothesized that the propensity to flood would be positively associated with parent's anger (i.e., anger experienced by parents in discipline encounters), child externalizing negative affect (e.g., temper tantrums) and overall child externalizing behavior, as well as physically aggressive, overreactive, and lax discipline, and poor parenting satisfaction. Finally, we hypothesized that PFS scores would show incremental concurrent validity in relation to discipline, after controlling for parent anger and externalizing child negative affect.

Method

Participants

Married or cohabitating heterosexual couples were recruited to participate in a study of family conflict. A total of 453 community couples from a suburban county in the New York metropolitan area with a child between the ages of 3 and 7 (51.9% female) were recruited by random digit dialing. (For a detailed description of the recruitment procedure, see Slep & O'Leary, 2005). Based on comparisons to US Census data for the county, the sample was reasonably representative of the local population (Slep, Heyman, Williams, Van Dyke, & O'Leary, 2006). In the final sample, 94.5% were married ($M = 9.5$ years; $SD = 4.4$). The mean age was 37.3 years ($SD = 6.0$) for fathers and 35.1 years ($SD = 5.0$) for mothers. The mean educational level was 14.3 years ($SD = 2.3$) for fathers and 14.3 years ($SD = 5$) for mothers, and the mean family income was \$81,450 ($SD = 43, 164$). The race/ethnicity of the sample was as follows: White (non-Hispanic): 80.7%; Hispanic/Latino: 8.6% (of any race); African American: 6.2%; Asian American: 2.0%; Other: 2.4%.

Procedure

Couples came to a university laboratory for two 3-hour sessions or one 6-hour session to complete the Institutional Review Board-approved protocol. Following informed consent, parents independently and privately completed a questionnaire battery and viewed video recordings of parent-child conflict. A subset of couples completed a shorter, subsequent visit, which included a re-administration of the PFS (follow-up $M = 5.6$ months, range 1.6 –

11.3 months; $n = 45$ mothers and 46 fathers). The retest participants did not significantly differ from the full sample on demographic characteristics or any variables examined in this study (all t -test results < 2). Families received \$250 for participation in the original study and \$50 for the additional assessment.

Measures

Parent flooding—The PFS (Slep & Heyman, 1998; see Appendix) is a 15-item measure designed to assess the degree to which parents experience their children's negative affect expressed during parent-child conflicts as unpredictable (e.g., “My child's distress seems to come out of nowhere”), overwhelming (e.g., “I can't think straight when my child is upset with me”), and disorganizing (e.g., “I feel paralyzed during my child's outbursts”), following Gottman's (1993) definition of flooding. Five face valid items were written for each of these three theorized elements of flooding. Participants rated each item from 1=*almost always* to 5=*never*. Responses were reverse scored and averaged so that higher scores indicate greater flooding.

Parent anger—Parents viewed a series of four professionally acted parent-child conflict videos (~90s each; shown in counterbalanced order) in which they were asked to imagine that they were the parent. At the end of each video vignette, participants rated their own experience of anger, irritation, and annoyance on scales ranging from 1=*not at all* to 5=*very strongly*. Anger experienced in response to video vignettes is associated with observed and self-reported overreactive discipline (Slep & O'Leary, 1998; 2007). Item averages were computed for each vignette (mean $\alpha = .89$ for mothers and .86 for fathers).

Child negative affect—Parents completed age appropriate versions of the widely used Child Behavior Checklist family of instruments (CBCL; Achenbach, 2009): the CBCL 2-3 or 4-18. Two items from the externalizing factor that represent child negative affect were selected for analysis: “screams” and “temper tantrums or hot temper.” These items were selected as they reflect negative child affect commonly displayed in parent-child discipline encounters and because they were included on both versions of the CBCL administered herein. Response choices are 0=*not true*, 1=*somewhat or sometimes true*, and 2=*very true or often true*. These items were used as indicators of a latent construct; no manifest composites (e.g., mean) were computed.

Child externalizing behavior—Parents completed the 36-item Eyberg Child Behavior Inventory, a widely used and validated measure of externalizing behavior for young children (Boggs, Eyberg, & Reynolds, 1990). For each item (e.g., “Acts defiant when told to do something.”), the parent indicates the behavior's frequency (from 1=*never* to 7=*always*) and whether it is “a problem” for them (yes/no, scored 1/0). The item frequency scores are summed to form an intensity composite score ($\alpha = .92$ for mothers and .93 for fathers) and problem scores are calculated by summing the dichotomous item problem ratings ($\alpha = .89$ for mothers and .89 for fathers).

Parent-to-child aggression—Aggressive parenting was measured with the p (CTS-PC; Straus, Hamby, Finkelhor, Moore, & Runyan, 1998). The CTS-PC is a widely used 22-item

self-report measure of the frequency (from 0 = *never* to 6 = *more than 20 times*) of parents' conflict resolution and discipline behaviors during the past 12 months. An average of the 18 psychological (e.g., name calling) and 13 physical (e.g., slapping) aggression items served as the variable for analysis. Psychological and physical aggression were strongly associated ($r_s = .58$ and $.59$ for mothers and fathers, respectively). We do not report alphas. Low alphas with the CTS-PC scales are typical and reflect that people who exhibit less extreme forms of aggression (e.g., slapping, yelling) most often do not exhibit more extreme forms of aggression (e.g., burning or scalding), although such behaviors clearly all fall within the domain of physical aggression (Shortt, Capaldi, Kim, & Owen, 2006).

Overreactive and lax discipline—The Parenting Scale (PS; Arnold, O'Leary, Wolff, & Acker, 1993) is a 30-item measure of parents' responses to child misbehavior. PS scores distinguish clinical from nonclinical samples and have been validated against behavioral observations of parenting and with item response theory methods (Arney, Rogers, Baghurst, Sawyer, & Prior, 2008; Arnold et al., 1993; Harvey, Danforth, Ulaszek, & Eberhardt, 2001; Lorber, Xu, Slep, Bulling, & O'Leary, 2014). Parents rate their use of discipline strategies on the PS using 7-point scales that are anchored by one effective (e.g., sets limits on what my child is allowed to do) and one ineffective discipline strategy (e.g., lets my child do whatever he/she wants.). An example of an overreactive discipline response is "When my child misbehaves... I raise my voice or yell." In contrast, lax discipline is measured with responses such as "When my child does something I don't like... I often let it go." Alpha coefficients were computed for the overreactivity ($\alpha = .74$ for mothers and $.75$ for fathers) and laxness subscales ($\alpha = .84$ for mothers and $.81$ for fathers).

Parenting satisfaction—The Satisfaction with the Parent-Child Relationship factor of the Parenting Satisfaction Scale (Guidubaldi & Cleminshaw, 1994) contains 15 items (e.g., "I am delighted with the relationship I have with my child"), which are rated from 1 = *strongly agree* to 4 = *strongly disagree*. The Parent-Child Relationship factor is associated with life and marital satisfaction (Guidubaldi & Cleminshaw, 1985) and distinguishes between clinic and non-clinic referred mothers of children 2 to 10 years old (Mouton & Tuma, 1988). An item average was computed and reverse scored so that higher scores indicate greater satisfaction ($\alpha = .81$ for fathers and $.82$ for mothers).

Analytic Strategy

Factorial validity—The factor structure of the PFS was evaluated via confirmatory factor analysis (CFA) in a structural equation modeling (SEM) framework using Mplus software (Muthén & Muthén, 1998-2012), with the robust maximum likelihood (MLR) estimator and missing data (0.07%) handled via the full information maximum likelihood (FIML) method. Model fit was judged relative to the conventions outlined by Kline (2010) and Browne and Cudeck (1993): comparative fit index (CFI) and Tucker-Lewis Index (TLI) at or above .90 and a root mean square error approximation (RMSEA) at or below .08. These thresholds are heuristic as fixed cutoffs are often arbitrary (Chen, Curran, Bollen, Kirby, & Paxton, 2008). Given our use of the MLR estimator and its corresponding Satorra-Bentler scaled (robust) χ^2 , differences in model fit were tested per Satorra and Bentler (2001), rather than with ordinary chi-square change (χ^2) comparisons.

Reliability—The PFS's internal consistency was evaluated via Cronbach's alpha (α) and test-retest stability was calculated in the retest subsample.

Concurrent validity—We hypothesized negative associations of flooding with parents' anger, child negative affect, parental discipline practices (aggression, overreactivity, laxness), and parenting satisfaction. Flooding items are reverse scored so that negative associations indicate a positive relationship. These hypotheses were evaluated by adding covariances of flooding with the above nine constructs to the final CFA model to capitalize on the psychometric advantages of a latent operationalization of flooding.

Incremental concurrent validity—In the last stage of analyses, we used SEM to investigate the ability of the latent flooding factors to predict discipline practices independent of child negative affect and parent anger.

Results

Factorial Validity

A single factor structure of the PFS was hypothesized and evaluated via dyadic CFA in Model 1. Latent factors for mothers' and fathers' flooding were simultaneously estimated, as reflected by the shared variance in the PFS's 15 items. The maternal and paternal flooding factors were allowed to covary. Factor means were set to 0 and variances to 1. All loadings were freely estimated. Model fit did not meet the a priori criteria, $\chi^2(404) = 1115.41$, CFI = .89, TLI = .88, RMSEA = .06. Modification indices (MIs) suggested the inclusion of three pairs of two pairs of correlated residuals for mothers and one for fathers. Items 2 (child “explode[s] without any warning signs”) and 6 (child's “distress seems to come out of nowhere”) are similarly worded items reflecting the unpredictability of child negative affect. Their residual covariances were indicated by large MIs for both mothers' and fathers' flooding. MIs also indicated the inclusion of a residual covariance of two maternal items reflecting the disorganizing component of flooding; mothers' becoming “all jumbled” (item 3) and their “brain[s] short-circuit[ing]” (item 5) when their children are upset. The inclusion of these three residual covariance in Model 2 (Figure 1), significantly improved model fit, $\chi^2(3) = 129.27$, $p < .001$. Model 2 met the a priori fit criteria and was therefore considered the final model, $\chi^2(401) = 962.92$, CFI = .91, TLI = .90, RMSEA = .06. Standardized loadings ranged from .54 to .82 for fathers ($M = .69$) and .60 to .83 for mothers ($M = .72$), $ps < .001$. Maternal and paternal flooding were positively associated with one another.

Parent gender differences—Factorial invariance in mothers' vs. fathers' flooding was also investigated. Following Meredith (1993), “weak” factorial invariance constraints were imposed in Model 3, in which each item's unstandardized factor loadings from Model 2 were equated for mothers and fathers. Although Model 3 was an adequate fit to the data, $\chi^2(416) = 1016.17$, CFI = .90, TLI = .90, RMSEA = .06, its fit was significantly worse than was that of Model 2, $\chi^2(15) = 129.27$, $p < .001$. Thus, weak factorial variance was not satisfied. A series of factorial invariance tests were conducted following the above model, but on an item-by-item basis to determine which loadings significantly differed for mothers and

fathers. Model 2 (all loadings freely estimated) was compared against 15 other models in which loadings for each item were individually equated for mothers and fathers. As summarized in an on-line supplement (Table S1) and indicated with “a” on the relevant paths in Figure 1, five of these tests were significant. For each of these five items, mothers’ loadings were significantly higher than fathers’ loadings. The corresponding standardized factor loadings were also higher by .05 to .15 ($M = .09$, $SD = .04$), as can be seen in Figure 1. Mothers’ higher factor loadings can likely be attributed to the slightly greater variability present in their data for these items; the ratio of the corresponding maternal to paternal item SD s ranged from 1.12 to 1.32 ($M = 1.18$). Based on computed PFC item averages (reverse scored), mothers ($M = 1.66$; $SD = 0.63$) reported more flooding than did fathers ($M = 1.54$; $SD = .54$), $t(452) = 3.66$, $p < .001$, $d = -0.17$.

Reliability

The PFS's internal consistency was high for both mothers ($\alpha = .94$) and fathers ($\alpha = .93$). The test-retest r s were .86 for fathers ($n = 46$) and .69 for mothers ($n = 45$), p s $< .001$. Given the variability in test-retest interval, we explored its impact on the test-retest r s. T1 flooding $\times$ test-retest interval interactions in predicting T2 flooding were nonsignificant (p s $> .29$), as evaluated in standard moderated multiple regression models. Yet, descriptively, test-retest r s were somewhat higher at shorter (r s = .87 for fathers and .75 for mothers), compared with longer (r s = .78 for fathers and .63 for mothers), intervals. These r s were based on a median split, breaking the sample into couples below (interval $M = 96.66$ days) and above (interval $M = 211.37$ days) the median test-retest interval.

Concurrent Validity

A series of SEM models that built on Model 2 (CFA) were estimated in which parent anger (Model 4a), child negative affect (Model 4b), child externalizing behavior (Model 4c), parental discipline (aggression, overreactivity, and laxness; Model 4d), and parenting satisfaction (Model 4e) were studied in relation to the latent flooding factors described in Model 2. The Model 2 covariance structure was preserved in all cases, with Models 4a-d simultaneously adding mothers’ and fathers’ reports of the criterion constructs. Each model adequately fit the data (Table S3). The paths from the regression of each criterion measure on flooding (for manifest criterion variables) or covariances of each criterion measure with flooding (for latent criterion variables), within parent gender, are the concurrent validity tests reported in Table 1. All such associations of flooding with criterion variables were significant at $p < .001$ (Table 1), with standardized associations (β s) ranging from relatively small (e.g., laxness; β s = .17 for mothers and fathers) to large (e.g., child externalizing behavior; β s = .54 and .66 for fathers and mothers, respectively). Model details follow.

Parent anger—In Model 4a, latent variables representing maternal and paternal anger in discipline encounters were modeled in relation to flooding. Anger ratings for each of the four parent-child conflict video vignettes were used as indicators of maternal (standardized loadings ranged from .71 to .75; $M = .74$) and paternal (standardized loadings ranged from .72 to .81; $M = .76$) parent anger factors. Covariances were allowed among the flooding and anger latent variables as well as between the residual variances of men's anger ratings for two of the vignettes.

Child negative affect—In Model 4b, a dual-informant latent variable representing child externalizing negative affect was modeled in relation to flooding. The child negative affect factor was modeled using two items per parent from the CBCL externalizing subscale: “screams” and “temper tantrums or hot temper.” CBCL items only have three response categories and caused model estimation difficulties when treated as continuous variables. Thus, they were modeled as ordinal indicators of a continuous negative latent child affect factor. As a corollary of this categorical approach in combination with the MLR estimator, numerical integration is required for model estimation. Thus, traditional fit indices and residual variance terms are not available. Yet (a) the well-established empirical history of screaming and temper tantrums as indicators of a single underlying construct (Achenbach, 2009), (b) the acceptably high standardized factor loadings (ranging from .62 to .78; $M = .68$), and (c) the fit of the child negative affect factor in its nomological network (see associations in Tables 1 and S2, as well as Figure 2) support the present construction of the child negative affect factor.

Child externalizing—In Model 4c, a dual-informant latent child externalizing behavior factor was modeled in relation to flooding. Mothers’ and fathers’ scores from the problem and intensity subscales of the ECBI were used as indicators of child externalizing behavior; standardized factor loadings ranged from .52 to .74 ($M = .63$). Residual variances were allowed between the two ECBI subscale scores within parent gender to reflect informant specific variance. All covariances were allowed among the latent flooding and externalizing factors.

Overreactive and lax discipline—In Model 4d, mothers’ and fathers’ CTS-PC aggression, PS overreactivity, and PS laxness were simultaneously regressed on maternal and paternal flooding within parent gender (i.e., maternal parenting was regressed on maternal flooding; paternal parenting was regressed on paternal flooding). Covariances were allowed among the six residual variance terms; three variables each for mothers and fathers.

Parenting satisfaction—In Model 4e, mothers’ and fathers’ PSAT parenting satisfaction was simultaneously regressed on flooding within parent gender, with the mother-father parenting satisfaction residual covariance included.

Incremental Concurrent Validity

In Model 5, building on Model 4a, the six discipline variables (aggression, overreactivity, and laxness for mothers and fathers) were simultaneously regressed on latent flooding factors (within parent gender), as well as the latent parent anger (within parent gender) and child negative affect factors described in Models 4b and 4c (Figure 2).

In Model 5 aggression, overreactivity, and laxness were regressed on flooding within parent gender, as in Model 4d, and simultaneously regressed on the parent anger factor described in Model 4a within parent gender as well as the dual-informant child negative affect factor described in Model 4b. All covariances among predictors (flooding, parent anger, and child negative affect) and among residual variance terms (aggression, overreactivity, and laxness)

were included in the model (Table S2), as were a correlated residual between fathers' anger ratings for two of the vignettes, and the correlated residuals included in Model 2.

As depicted in Figure 2, flooding was significantly uniquely associated with paternal aggression, overreactivity, and laxness after controlling for parent anger and child negative affect. In contrast, the only form of maternal parenting uniquely predicted by flooding was overreactivity.

Discussion

The results of this study provide support for the validity of the PFS scale as a measure of parental flooding; that is, parents' experience of their children's negative affect during parent-child conflict as unexpected, overwhelming, and distressing. The one-factor scale structure was psychometrically strong for both mothers and fathers, consistent with Gottman's (1993) conceptualization of flooding as a single yet multifaceted construct. Although full measure invariance across genders was not supported due to higher loadings on some items for mothers than fathers, the overarching factor structure was similar across gender suggesting the PFS is appropriate for both mothers and father. Test-retest stability over an average of 5.6 months was high, although the test-retest sample size was small.

Mothers reported modestly greater flooding than did fathers. Despite an increase in father involvement in childcare activities in recent decades, women still spend considerably more time than do men in childcare responsibilities (Bianchi & Milkie, 2010). Thus mothers, compared with fathers, may have greater exposure to child negative affect, particularly during discipline encounters. Women's higher flooding scores may be indicative of more time and energy mothers, compared with fathers, spend managing their children's affective experiences. Maternal flooding was found to be positively associated with negative child affect in both the present investigation and Lorber et al. (2015). Perhaps greater exposure to child negative affect sensitizes mothers to an overlearned flooded response.

As expected, the PFS demonstrated concurrent validity with other factors in the nomological network of flooding. Flooding was positively related to aggressive parenting, lax and overreactive discipline, parent anger, as well as child negative affect and externalizing behavior. These results are consistent with observations that intense negative emotions in response to child negative affect are related to dyadic escalation and dysfunctional discipline behaviors that are often successful in terminating the immediate distress, even at the cost to long-term socialization goals (Gottman & DeClaire, 1997; Granic & Patterson, 2006; Patterson, 2002; Snyder, Edwards, McGraw, Kilgore, & Holton, 1994). Flooding was also negatively associated with satisfaction in the parenting role. Parallel to what has been hypothesized in the couples' literature (Gottman, 1993), flooding may lead to worse relationship satisfaction by fostering hypervigilance to cues of impending child negative affect and hostile attributions for such displays.

The substantial positive associations of both mothers' and fathers' flooding with child negative affect and externalizing behavior were particularly informative in that these associations were not compromised by a shared informant confound. Child negative affect

and externalizing behavior were operationalized as dual informant latent variables, representing shared (i.e., not reporter specific) interparental variance in ratings of the child. Moreover, although not an a priori hypothesis, maternal and paternal flooding were positively associated. Thus, PFS scores were not solely associated with other factors measured by the same informant's reports.

Finally, tests of incremental validity further suggest that the PFS is identifying a construct distinct from parents' experienced anger and their children's negative affect. Given that flooding is definitionally an experiential reaction to child negative affect, and that it is empirically associated with parent anger and child negative affect, it was particularly important to rule out the possibility that the PFC was merely a measure of these two factors. The PFC predicted mothers' and fathers' overreactive discipline, as well as fathers' aggression and lax discipline, after controlling for parent anger and externalizing child negative affect. Taken together with similar findings from Lorber et al. (2015), the present findings suggest that the PFS may tap a risk factor that is often theorized to play a role in dysfunctional discipline, particularly overreactive discipline, but rarely explored.

Flooding may reflect bottom-up influences that are hypothesized to undermine top-down cognitive control processes (Metcalf & Mischel, 1999). Highly emotional contexts hamper parents' abilities to monitor contextual cues and adjust their own responses to their children's needs. Instead of flexibly responding to their children, parents' overlearned dysfunctional discipline responses are triggered (Granic & Patterson, 2006). The associations between parent negative affect and discipline practices are doubtlessly complex. For example, Coplan, Hastings, Lagacé-Séguin, and Moulton (2002) found that moderate levels of anger were associated with authoritative parenting, suggesting that there may be a level of anger that is adaptive and leads to appropriate discipline (e.g., connotes parent engagement and possible responsiveness to children's needs). However, in keeping with the Yerkes-Dodson law (Yerkes & Dodson, 1908), a little heightened emotion may improve performance but substantial elevation degrades it, making flooding a risk for harsh or abusive discipline behavior. An expanded analysis of the relation between flooding, cognitions, and parenting behaviors in future research may offer a more fine-tuned model of parenting.

Children's difficult behavior influences parents' discipline behavior and emotional experience (Arnold & O'Leary, 1995; Del Vecchio, & Rhoades, 2010; Reid, Patterson, & Snyder, 2002). Although we found that flooding was associated with parenting practices and children's negative affect and externalizing behaviors, the direction of the effects is unclear. A greater understanding of how flooding influences and is influenced by child behavior is clearly needed.

A clear strength of this study is the use of a large, representative community sample of both fathers and mothers, which enhances generalizability. Yet, as with all inferences regarding validity (see Haynes & O'Brien, 2000), these results are context-dependent. The sample comprised English-speaking couples from one geographic sampling frame who had been living together for at least a year and who had a child between 3–7 years old. And, though the sample composition reflected the community from which we recruited participants, our

sample was primarily white and middle-income. The extent to which the factor structure generalizes to more ethnically and socioeconomically diverse parents is uncertain. Moreover, the associations with measures of dysfunctional parenting and aggressive parenting may differ among diverse populations. Although we did not develop the PFS to be culturally specific, the PFS contains item phrasing such as “short-circuit” (item 5) and “taken aback” (item 13) that might reflect culturally idiosyncratic ways of expression. If examining the PFS across different cultures and languages, it may prove useful to consider an emic approach and make modifications that retain the tenor of the item in cases for which the original wording would be awkward. In addition, the extent to which the PFS will be a reliable and valid indicator in clinical samples cannot be determined in this sample.

Although we found evidence that flooding was distinct from, albeit associated with, child evoked anger, other negative emotions unaccounted for in this study may account for differences in discipline behavior as well as or better than the propensity to emotionally flood. For example, parental anxiety is also associated with harsh discipline responses (Laskey & Cartwright-Hatton, 2009). Perhaps parents reporting high levels of anxiety are more prone to emotionally flood due to the overlap in constructs. Alternatively, the propensity to emotionally flood may be the distinguishing characteristic for anxious parents at risk for dysfunctional discipline responding. Measures that capture emotional states other than anger would be helpful to include in future studies of the PFS to distinguish flooding from other negative emotions. The use of multiple methods of assessment, including neuroscientific methods (e.g., fMRI) and physiological measures (e.g., heart rate), and the inclusion of other measures of parents’ emotions and emotional regulation could enhance our theoretical models of flooding. Finally, a greater understanding of the impact of flooding on executive functioning and emotion regulatory abilities would clarify the influence of flooding on self-regulatory processes.

As work in this area progresses, use of multiple methods of analysis will be important to better understand how flooding functions within a discipline interaction. The relations among flooding, discipline, and child behavior are likely dynamic reflecting the contextual and behavioral variations in parent-child interactions. Our use of self-report measures precluded examination of such dynamics. The use of observational methods and approaches designed to capture the time varying associations of emotion and observed behavior have recently been applied successfully to parenting (e.g., Lorber & Slep, 2005). The use of such methods is needed to determine the ways in which the scale may need to be modified and, ultimately, may prove critical in advancing our theoretical understanding of flooding.

As suggested by an anonymous reviewer, time frame may also be an important consideration in future research. The PFS does not specify a time frame, but is based on an implicit assumption that flooding is a consistent trait that varies little over time. The high stability reported herein supports the fairly consistent positions of parents relative to one another in the distribution of flooding. Yet we also found evidence of diminishing test-retest reliability over time. This pattern suggests that flooding is likely a dynamic construct, perhaps one that exhibits meaningful change over time in relation to causal factors such those identified cross-sectionally in the present study (e.g., child externalizing behavior).

Despite its theoretical relevance to the study of parent discipline behavior and aggressive parenting, little research has been conducted on flooding experienced during parent-child conflict. The PFS is brief and cost-effective, designed to assess the degree to which parents believe their children's negative affect during parent-child conflict is unexpected, overwhelming, and distressing. The results of this study indicate that the PFS is psychometrically sound and assesses an experience distinct from anger. Clinically, it may prove useful to assess the tendency to emotionally flood as part of a comprehensive assessment of parent and child behavior. If parents report elevated flooding in response to their children's negative affect, flooding could be a potential intervention target.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

This research was supported in part by National Institute of Mental Health Grant R01MH57985.

Appendix

Appendix

Parent Emotional Flooding Scale

Instructions: Please use the following scale to rate how often you feel this way when you have conflicts with the target child.

	Almost Always	Often	Sometimes	Rarely	Never
1. I find my child's distress to be overwhelming	1	2	3	4	5
2. My child tends to explode without any warning signs	1	2	3	4	5
3. I get all jumbled when my child is upset	1	2	3	4	5
4. I get so stressed when my child blows up at me that I shut down	1	2	3	4	5
5. My brain short-circuits when my child gets upset	1	2	3	4	5
6. My child's distress seems to come out of nowhere	1	2	3	4	5
7. My child's distress overpowers me	1	2	3	4	5
8. Distress from my child makes me unable to focus	1	2	3	4	5
9. The intensity of my child's distress catches me off guard	1	2	3	4	5
10. I feel flooded by my child's distress	1	2	3	4	5
11. I can't predict when my child will blow up at me	1	2	3	4	5
12. I feel paralyzed during my child's outbursts	1	2	3	4	5
13. I'm taken aback by how upset my child gets during an argument	1	2	3	4	5
14. My child's distress leaves me feeling disorganized and stressed	1	2	3	4	5
15. I can't think straight when my child is upset with me	1	2	3	4	5

All items are reversed scored.

References

- Achenbach, TM. Achenbach system of empirically based assessment (ASEBA): Development, findings, theory, and applications. Author; Burlington, VT: 2009.
- Arney F, Rogers H, Baghurst P, Sawyer M, Prior M. The reliability and validity of the parenting scale for Australian mothers of preschool-aged children. *Australian Journal of Psychology*. 2008; 60:44–52. doi:10.1080/00049530701458076.
- Arnold DS, O'Leary SG, Wolff LS, Acker MM. The parenting scale: A measure of dysfunctional parenting in discipline situations. *Psychological Assessment*. 1993; 5:137–144. doi:10.1037/1040-3590.5.2.137.
- Arnold EH, O'Leary SG. The effect of child negative affect on maternal discipline behavior. *Journal of Abnormal Child Psychology*. 1995; 23:585–595. doi:10.1007/BF01447663. [PubMed: 8568081]
- Bianchi SM, Milkie MA. Work and family research in the first decade of the 21st century. *Journal of Marriage and Family*. 2010; 72:705–725. doi:10.1111/j.1741-3737.2010.00726.x.
- Boesch RP, Cerqueira R, Safer MA, Wright TL. Relationship satisfaction and commitment in long-term male couples: Individual and dyadic effects. *Journal of Social and Personal Relationships*. 2007; 24:837–853. doi:10.1177/0265407507084186.
- Boggs SR, Eyberg S, Reynolds LA. Concurrent validity of the Eyberg child behavior inventory. *Journal of Clinical Child Psychology*. 1990; 19:75–78. doi:10.1207/s15374424jccp1901_9.
- Browne, MW.; Cudeck, R. Alternative ways of assessing model fit.. In: Bollen, KA.; Long, JS., editors. *Testing Structural Equation Models*. Sage; Newbury Park, CA: 1993. p. 136-162.
- Chen F, Curran PJ, Bollen KA, Kirby J, Paxton P. An empirical evaluation of the use of fixed cutoff points in RMSEA test statistic in structural equation models. *Sociological Methods and Research*. 2008; 36:462–494. doi:10.1177/0049124108314720. [PubMed: 19756246]
- Coplan RJ, Hastings PD, Lagacé-Séguin DG, Moulton CE. Authoritative and authoritarian mothers' parenting goals, attributions, and emotions across different childrearing contexts. *Parenting: Science and Practice*. 2002; 2:1–26. doi:10.1207/S15327922PAR0201_1.
- Del Vecchio T, Rhoades K. Bi-directional influences in mother-toddler dyads. *Infant and Child Development*. 2010; 19:516–529. doi:10.1002/icd.674. [PubMed: 20953329]
- Dix T. The affective organization of parenting: Adaptive and maladaptive processes. *Psychological Bulletin*. 1991; 110:3–25. doi:10.1037/0033-2909.110.1.3. [PubMed: 1891517]
- Doohan EM, Carrère S, Riggs ML. Using relational stories to predict the trajectory toward marital dissolution: The oral history interview and spousal feelings of flooding, loneliness, and depression. *Journal of Family Communication*. 2010; 10:57–77. doi:10.1080/15267430903396401.
- Fabes RA, Eisenberg N, Miller P. Maternal correlates of children's vicarious emotional responsiveness. *Developmental Psychology*. 1990; 26:639–648. doi:10.1037/0012-1649.26.4.639.
- Fabes RA, Poulin RE, Eisenberg N, Madden-Derdich DA. The coping with children's negative emotions scale (CCNES): Psychometric properties and relations with children's emotional competence. *Marriage & Family Review*. 2002; 34:285–310. doi:10.1300/J002v34n03_05.
- Gottman JM. A theory of marital dissolution and stability. *Journal of Family Psychology*. 1993; 7:57–75. doi:10.1037/0893-3200.7.1.57.
- Gottman, JM. *What predicts divorce? The measures*. Lawrence Erlbaum Associates; Hillsdale, NJ: 1996.
- Gottman JM, Katz L. Effects of marital discord on young children's peer interaction and health. *Developmental Psychology*. 1989; 25:373–381. doi:10.1037/0012-1649.25.3.373.
- Gottman, JM.; DeClaire, J. *The heart of parenting: How to raise an emotionally intelligent child*. Simon & Schuster; New York, NY: 1997.
- Granic I, Patterson GR. Toward a comprehensive model of antisocial development: A dynamic systems approach. *Psychological Review*. 2006; 13:101–131. doi:10.1037/0033-295X.113.1.101. [PubMed: 16478303]
- Guidubaldi J, Cleminshaw HK. The development of the Cleminshaw-Guidubaldi parent satisfaction scale. *Journal of Clinical Child Psychology*. 1985; 14:293–298. doi:10.1207/s15374424jccp1404_4.

- Guidubaldi, J.; Cleminshaw, HK. Parenting satisfaction scale: Manual. Psychological Corporation; San Antonio, TX: 1994.
- Harvey E, Danforth JS, Ulaszek WR, Eberhardt TL. Validity of the parenting scale for parents of children with attention-deficit/hyperactivity disorder. *Behaviour Research and Therapy*. 2001; 39:731–743. doi:10.1016/S0005-7967(00)00052-8. [PubMed: 11400716]
- Haynes, SN.; O'Brien, WH. Principles and practice of behavioral assessment. Kluwer Academic/ Plenum Publishers; New York, NY: 2000.
- Kline, RB. Principles and practice of structural equation modeling. Guilford; New York, NY: 2010.
- Kunzmann U, Kupperbusch CS, Levenson RW. Behavioral inhibition and amplification during emotional arousal: A comparison of two age groups. *Psychology and Aging*. 2005; 20:144–158. doi:10.1037/0882-7974.20.1.144. [PubMed: 15769220]
- Laskey BJ, Cartwright-Hatton S. Parental discipline behaviours and beliefs about their child: Associations with child internalizing and mediation relationships. *Child: Care, Health and Development*. 2009; 35:717–727. doi:10.1111/j.1365-2214.2009.00977.x.
- Leerkes EM. Predictors of maternal sensitivity to infant distress. *Parenting: Science and Practice*. 2010; 10:219–239. doi: 10.1080/15295190903290840.
- Lorber MF, Slep AMS. Mothers' emotion dynamics and their relations with harsh and lax discipline: Microsocial time series analyses. *Journal of Clinical Child and Adolescent Psychology*. 2005; 34:559–568. doi:10.1207/s15374424jccp3403_11. [PubMed: 16026219]
- Lorber MF, Mitnick DM, Slep AMS. Parents' experience of flooding in discipline encounters: Associations with discipline and interplay with related factors. *Journal of Family Psychology*. 2015 doi: 10.1037/fam0000176.
- Lorber MF, Xu S, Slep AMS, Bulling LJ, O'Leary SG. A new look at the psychometrics of the parenting scale through the lens of item response theory. *Journal of Clinical Child and Adolescent Psychology*. 2014; 43:613–626. doi:10.1080/15374416.2014.900717. [PubMed: 24828855]
- Mammen OK, Kolko DJ, Pilkonis PA. Negative affect and parental aggression in child physical abuse. *Child Abuse & Neglect*. 2002; 26:407–424. doi:10.1016/S0145-2134(02)00316-2. [PubMed: 12092806]
- Martin SE, Clements ML, Crnic KA. Maternal emotions during mother-toddler interaction: Parenting in affective context. *Parenting: Science and Practice*. 2002; 2:105–126. doi:10.1207/S15327922PAR0202_02.
- Mence M, Hawes DJ, Wedgwood L, Morgan S, Barnett B, Kohlhoff J, Hunt C. Emotional flooding and hostile discipline in the families of toddlers with disruptive behavior problems. *Journal of Family Psychology*. 2014; 28:12–21. doi:10.1037/a0035352. [PubMed: 24392687]
- Meredith W. Measurement invariance, factor analysis and factorial invariance. *Psychometrika*. 1993; 58:525–543. doi:10.1007/BF02294825.
- Metcalf J, Mischel W. A hot/cool-system analysis of delay of gratification: Dynamics of willpower. *Psychological Review*. 1999; 106:3–19. doi:10.1037/0033-295X.106.1.3. [PubMed: 10197361]
- Mouton PY, Tuma JM. Stress, locus of control, and role satisfaction in clinic and control mothers. *Journal of Clinical Child Psychology*. 1988; 17:217–224. doi:10.1207/s15374424jccp1703_4.
- Muthén, LK.; Muthén, BO. Mplus user's guide. 7th Edition. Author; Los Angeles, CA: 1998-2012.
- Palomba D, Sarlo M, Angrilli A, Mini A, Stegagno L. Cardiac responses associated with affective processing of unpleasant film stimuli. *International Journal of Psychophysiology*. 2000; 36:45–57. doi:10.1016/S0167-8760(99)00099-9. [PubMed: 10700622]
- Patterson, GR. The early developmental of coercive family process.. In: Reid, JB.; Patterson, GR.; Snyder, J., editors. *Antisocial behavior in children and adolescents: Developmental theories and models for intervention*. American Psychological Association; Washington, DC: 2002. p. 25-44.
- Rachman S. Studies in desensitization-II: Flooding. *Behaviour Research and Therapy*. 1966; 4:1–6. doi:10.1016/0005-7967(66)90037-4. [PubMed: 5929526]
- Reid, JB.; Patterson, GR.; Snyder, J. *Antisocial behavior in children and adolescents: A developmental analysis and model for intervention*. American Psychological Association; Washington, DC: 2002.
- Satorra A, Bentler PM. A scaled difference chi-square test statistic for moment structure analysis. *Psychometrika*. 2001; 66:507–514. doi:10.1007/s11336-009-9135-Y.

- Shortt JW, Capaldi DM, Kim HK, Owen LD. Relationship separation for young, at-risk couples: Prediction from dyadic aggression. *Journal of Family Psychology*. 2006; 20:624–631. doi: 10.1037/0893-3200.20.4.624. [PubMed: 17176197]
- Slep, AMS.; Heyman, RE. Parental flooding scale. Stony Brook University, State University of New York; 1998. Unpublished manuscript
- Slep AMS, O'Leary SG. The effects of maternal attributions on parenting: An experimental analysis. *Journal of Family Psychology*. 1998; 12:234–243. doi:10.1037/0893-3200.12.2.234.
- Slep AMS, O'Leary SG. Parent and partner violence in families with young children: Rates, patterns, and connections. *Journal of Consulting and Clinical Psychology*. 2005; 73:435–444. doi: 10.1037/0022-006X.73.3.435. [PubMed: 15982141]
- Slep AMS, O'Leary SG. Multivariate models of mothers' and fathers' aggression toward their children. *Journal of Consulting and Clinical Psychology*. 2007; 75:739–751. doi:10.1037/0022-006X.75.5.739. [PubMed: 17907856]
- Slep AMS, Heyman RE, Williams MC, Van Dyke CE, O'Leary SG. Using random telephone sampling to recruit generalizable samples for family violence studies. *Journal of Family Psychology*. 2006; 20:680–689. doi:10.1037/0893-3200.20.4.680. [PubMed: 17176204]
- Snyder JJ, Edwards P, McGraw K, Kilgore K, Holton A. Escalation and reinforcement in mother-child conflict: Social processes associated with the development of physical aggression. *Development and Psychopathology*. 1994; 6:305–321. doi:10.1017/S0954579400004600.
- Straus MA, Hamby SL, Finkelhor D, Moore DW, Runyan D. Identification of child maltreatment with the parent-child conflict tactics scales: Development and psychometric data for a national sample of American parents. *Child Abuse & Neglect*. 1998; 22:249–270. doi:10.1016/S0145-2134(97)00174-9. [PubMed: 9589178]
- Westen D, Rosenthal R. Quantifying construct validity: Two simple measures. *Journal of Personality and Social Psychology*. 2003; 84:608–618. doi:10.1037/0022-3514.84.3.608. [PubMed: 12635920]
- Yerkes RM, Dodson JD. The relation of strength of stimulus to rapidity of habit-formation. *Journal of Comparative Neurology and Psychology*. 1908; 18:459–482. doi:10.1002/cne.920180503.

Figure 1.

Confirmatory factor analysis; standardized loadings; all loadings and covariances significant at $p < .001$; loadings (unstandardized) marked with "a" differed for mothers and fathers; robust χ^2 (401) = 962.92, CFI = 0.91, TLI = 0.90, RMSEA = 0.06.

Figure 2.

Incremental validity of flooding in relation to parenting; covariances among predictors and residuals are reported in Table S2 and not pictured; all factor loadings are significant at $p < .001$; * $p < .05$, ** $p < .01$, *** $p < .001$

Table 1

Concurrent Validity of Flooding in Relation to Parent and Child Factors

Model	Criterion Construct	Predictor					
		Father Flooding			Mother Flooding		
		β	SE	t	β	SE	t
4a	Parent anger ^a	0.22	0.05	4.72	0.27	0.05	5.37
4b	Child negative affect ^a	0.44	0.06	6.94	0.56	0.05	11.03
4c	Child externalizing ^a	0.54	0.08	6.71	0.66	0.05	12.68
4d	Aggression ^b	0.29	0.05	5.92	0.32	0.04	7.28
4d	Overreactivity ^b	0.36	0.05	8.10	0.44	0.04	11.81
4d	Laxness ^b	0.17	0.05	3.82	0.17	0.05	3.75
4e	Parenting satisfaction ^b	-0.32	0.06	-5.65	-0.41	0.05	-9.09

Note. β s are standardized covariances (a) and paths (b) from SEM models, evaluated against robust SEs; all $ps < .001$.